Bay Area Air Quality Management District
939 Ellis Street
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PROPOSED AMENDMENTS TO DISTRICT REGULATION 8, RULE 34: SOLID WASTE DISPOSAL SITES

TECHNICHAL ASSESSMENT MEMORANDUM

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EXECUTIVE SUMMARY

Solid Waste Disposal Sites, or landfills, are sources of methane and organic compound emissions. As solid waste decomposes, it produces landfill gas via a naturally occurring bacterial process. Landfill gas contains mainly methane and carbon dioxide plus small amounts of nitrogen and non-methane organic compounds (NMOCs). Many of the NMOCs are toxic air contaminants. If left uncontrolled, landfill gas could seep through the landfill surface and cause significant emissions of precursor organic compounds and toxic compounds. Uncontrolled landfill gas may also migrate underground to surrounding properties or build to explosive concentrations underground. Uncontrolled landfill gas poses fire, health and safety hazards.

On May 2, 1984, the District adopted Regulation 8, Rule 34 to control the emissions of methane and other organic compounds in landfill gas. The rule has been amended four times since then to clarify and tighten standards, reduce the need for variances, and to improve the flexibility of the rule. The current rule requires landfills with more than 1 million tons of decomposable solid waste in-place to collect landfill gas and process this gas through an emission control system. Emission control systems are usually enclosed flares, engines, or gas turbines. The rule specifies operating requirements for the landfill gas collection system, sets minimum methane and organic compound removal efficiencies for emission control systems, and limits the amount of methane and organic compounds that may be emitted from the landfill surface.

On March 12, 1996, EPA adopted 40 CRF Part 60 Subpart Cc – Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills and Subpart WWW – Standards of Performance for Municipal Solid Waste Landfills. Subpart Cc requires each state to develop a plan to comply with the federal requirements for the affected landfills. The California Air Resources Board (CARB) is requiring each District to develop a compliance strategy for these federal requirements. Most of the landfills in the Bay Area will be subject to the federal requirements. On September 15, 1997 the District informed CARB that the District would comply by modifying Regulation 8, Rule 34.

Most of the proposed rule amendments are intended to meet the District's obligation to implement the federal emission guidelines for municipal solid waste landfills. Staff has also proposed changes to exemptions, definitions, and administrative requirements. These changes are intended to improve clarity, enhance flexibility, and streamline compliance with collection system expansion requirements.

The proposed amendments to the description section of the rule are intended to notify landfill operators that the use of contaminated soil as a cover material is an aeration operation subject to Regulation 8, Rule 40. The District plans to propose amendments to Regulation 8, Rule 40 later this year. This will impact

landfills that use VOC laden materials in cover operations. The Regulation 8, Rule 40 amendments are expected to achieve significant emission reductions.

The proposed amendments to Regulation 8, Rule 34 will not result in measurable emission reductions. These rule changes will result in no significant incremental costs to industry and no adverse environmental impacts. The requirements for District staff review of design plans and Title V permits will result in a moderate short-term increase in District staff requirements. Once the initial reviews and permits are completed, the new requirements will result in a small long-term increase in District staff requirements. The District plans to propose modifications to Regulation 3, Schedule K to recover these additional staff costs.

The proposed amendments meet the California Health and Safety Code, Section 40727, requirements for necessity, clarity, consistency, non-duplication, and reference.

BACKGROUND

Emission Sources

Solid Waste Disposal Sites, or landfills, have many operations that result emissions of pollutants into the atmosphere. The waste decomposition process generates methane and organic compound emissions. Other operations, such as handling of contaminated wastes, composting, and material storage, can also generate organic compound emissions. Vehicle traffic, earth moving operations, sorting and recycling equipment, wood waste grinding equipment, and composting operations cause particulate emissions. Vehicals, off-road construction equipment, stationary power generators, and landfill gas emission control systems cause combustion emissions, such as nitrogen oxides, carbon monoxide, and sulfur dioxide.

One of the largest sources of organic emissions at a landfill is the waste decomposition process. Over time, waste buried in the landfill breaks down via a naturally occurring bacterial decomposition process. This decomposition process generates landfill gas. The decomposition process goes through several phases. Most landfill gas is produced during the anaerobic phase, when the oxygen supply has been exhausted. The amount of landfill gas produced, the rate at which it is produced, and the content of the landfill gas vary from site to site depending on the type of waste placed, compaction processes, soil type, moisture content, temperature, and other factors. Typical landfill gas contains 55% methane, 40% carbon dioxide, 5% nitrogen, and trace amounts of non-methane organic compounds (NMOCs). (1) The NMOCs include a wide array of compounds such as alkanes, alcohols, ketones, aromatics, halogenated compounds, and sulfur compounds. Many of these NMOCs are toxic air contaminants. If left uncontrolled, the landfill gas will seep out of the landfill surface, resulting in significant levels of organic compound emissions. Uncontrolled landfill gas poses fire, health and safety hazards. At uncontrolled landfills, the methane concentration underground could increase to explosive levels, or gas may migrate underground to surrounding properties. Water soluble components of landfill gas may also contaminate ground water.

Regulation 8, Rule 34 was adopted to control the emissions generated by the waste decomposition process. Therefore, this report will focus on controlling landfill gas emissions. Some of the other sources of emissions are briefly discussed below.

Other sources of organic compound emissions include the on-site handling of soils and sewage or industrial sludge contaminated with volatile organic compounds and the use of these contaminated soils or sludges as cover materials. Landfills are required by The California Integrated Waste Management Board to cover the waste they receive on a daily basis with suitable material compacted to at least 6 inches to reduce odors and scavenging pests. Landfill areas are left inactive for longer than a day require thicker cover material. Typically, clean soil is used as the cover material. However, other materials may also be approved as “alternative” cover materials including: shredded green waste, shredded tires, non-hazardous contaminated soil, compost, stabilized sludge, and sludge mixed with clean soil or mixed with any of the other materials.

Some Bay Area landfills are using contaminated soil as an alternative cover material. The contaminated soil is delivered to the site by truck and unloaded into stockpiles. The soil may then be moved closer to the working face of the landfill, where wastes are actively being placed. At the close of the day, the contaminated soil is spread over the garbage and compacted. Some Bay Area landfills are using sewage sludge and other types of industrial sludge in alternative cover materials. Sludge is typically too wet to directly use as cover material. Therefore, it must first be dried or mixed with other dry materials to achieve suitable moisture content. These sludge mixtures may then be spread and compacted to cover the garbage. The unloading, on-site movement, drying, mixing, and spreading of contaminated soils or sludge encourage the volatilization of organic compounds from these materials into the atmosphere. Such activities can result in significant precursor organic compound emissions and/or significant toxic emissions.

Using VOC contaminated materials in a cover operation is considered to be an aeration operation and is currently subject to Regulation 8, Rule 40 requirements. The District is now considering several new pollution prevention measures and control requirements for aeration operations and related activities. These control measures are being proposed to achieve emission reductions required by the 1999 Clean Air Plan. Any impacts that these new requirements will have on Bay Area landfills will be discussed in a separate staff report on the proposed amendments to Regulation 8, Rule 40.

Landfills that are currently accepting waste are also significant sources of particulate emissions due to earth moving equipment, vehicle traffic, and wind erosion, recycling equipment and related operations. Particulate emissions from active landfills are limited by District Regulation 6 and will not be discussed in this report.

Emission Controls

Landfill gas emissions are controlled by maintaining an impermeable cover, or cap, over the buried refuse and by collecting the gas and processing it through an emission control system. The cap reduces the amount of landfill gas that can seep into the atmosphere. Rain and temperature fluctuations can result in cracks in the cap, especially near gas collection equipment. These cracks create a path for landfill gas to escape into the atmosphere. Landfill operators maintain the integrity of the cap through vigilantly observing the soil and vegetative cover, monitoring of landfill surface emissions, and performing quick repairs. Although Regulation 8, Rule 34 has a landfill surface leak limit, it does not currently require monitoring to ensure that this limit is being met.

Landfill gas may be collected by using either a passive or an active collection system. Both systems use vertical wells or horizontal collectors (perforated pipes placed within the buried refuse) connected by pipes to a header pipe. The header pipe is then vented to the emission control system. In the passive collection system, landfill gas pressure is allowed increase naturally until there is enough gas being generated by decomposing refuse to create a pressure gradient. The increasing pressure in the buried refuse pushes landfill gas into the collection pipes and on to the emission control system. In an active collection system, blowers are used to create a vacuum within the piping system. Landfill gas is then drawn into the perforated pipes, because of the pressure gradient, and vented to the emission control system. Active collection

systems are considered to be more effective. Regulation 8, Rule 34 currently requires the use of an active collection system.

There are two types of emission control systems that may be used to control organic emissions in the collected landfill gas: combustion type controls and non-combustion type controls. Combustion type controls include equipment with no energy recovery capabilities (open or closed flares) and equipment that can recover some of the heat produced by burning landfill gas. Some types of energy recovery equipment are boilers, gas turbines, and internal combustion engines. Regulation 8, Rule 34 does not allow the use of open flares to control landfill gas emissions. Enclosed flares are currently the most prevalent control option in the Bay Area due to their low cost, ease of operation, and reliability. However, some Bay Area landfills are currently using energy recovery equipment to control collected landfill gas. Many landfills are reinvestigating using energy recovery equipment due to recently enacted utility deregulation requirements and tax incentives. These incentives have made energy recovery a more economically viable option. For sites relying mainly on energy recovery equipment to control collected landfill gas, enclosed flares are usually employed as back-up control devices. All combustion type emission control systems will produce secondary pollutant emissions such as nitrogen oxides, carbon monoxide, sulfur dioxide, and particulate matter (PM_{10}). Due to the presence of halogenated compounds in the landfill gas, combustion equipment can also produce acid gases (hydrogen chloride, hydrogen fluoride, or hydrogen bromide) as secondary pollutants. Secondary pollutants are limited by other District requirements: Regulation 2, Rule 2; Regulation 9, Rules 1, 7, 8, and 9; and the Toxic Risk Management Policy.

Rarely, non-combustion control, such as carbon adsorption, is used to remove the organic compounds from the landfill gas. Carbon adsorption is normally only used in conjunction with a flare (to achieve higher control of toxic emissions) or for treatment of landfill gas so that it can be sold as a product.

History of Control

On May 2, 1984, the District adopted Regulation 8, Rule 34 to control the emissions of methane and other organic compounds in landfill gas generated at solid waste disposal sites. The rule has been revised four times since adoption to clarify standards, incorporate ARB control guidelines, reduce the need for variances, and to improve the enforceability of the rule. Each revision is discussed in more detail below.

On September 17, 1986, Regulation 8, Rule 34 was amended in conjunction with the Calderon Bill, AB 3374, which was enacted by the State Legislature and signed by the governor in September, 1986. AB 3374 modified California Health and Safety Code Section 41805.5 requiring all active (operating) solid waste disposal sites throughout California to conduct testing to determine the composition of landfill gases, the presence of specified toxic air contaminants, and whether off-site subsurface migration of landfill gas was occurring. This legislation also required operators to report the test results to local air districts for their analysis to determine whether the disposal site posed a risk to human health or a threat to the environment. Depending upon the results of the testing, which became known as Solid Waste Air Quality Assessment Test (SWAT) reports, a landfill could be required to install a gas collection and control system. In addition, non-operating (inactive) landfills were required to submit screening

questionnaires to the appropriate air district for evaluation to determine whether a SWAT report would be required.

Regulation 8, Rule 34 was not amended again until November 17, 1993. In the intervening six years, the California Air Resources Board in cooperation with other air pollution control agencies, published a suggested control measure (SCM) for Landfill Gas Systems. The 1993 amendments incorporated many aspects of the SCM including leak limit of 1000 ppm for both the gas collection/control system and the landfill surface cap. In addition, exemptions were added for uncontrolled, inactive landfills that contain gas with low levels of methane and organics, and to allow up to 12 hours per month downtime of the gas collection and control equipment for inspection and maintenance purposes. A provision that provided for less than continuous operation of the gas collection and control system when supplemental fuel was required to augment landfill gas to keep a flare or other control equipment operating, and record keeping requirements to verify the exemptions were also adopted at this time.

On June 15, 1994, a minor amendment was made to Regulation 8, Rule 34 to include EPA approved test methods for determining organic compound emissions.

The last amendment to Regulation 8, Rule 34 was approved on July 17, 1996. The primary reasons for the 1996 amendments were to reduce the number of variance requests from certain Regulation 8, Rule 34 requirements, which were found to be overly restrictive, and to reduce the cost of compliance with the gas collection system requirements. In 1994 and 1995, the District received a large number of variance requests for relief from the collection and control system down time limits. In most cases, the down time was required to perform work on the landfill or gas collection system that was required by our rule or by other agencies. These collection and control system down times were determined to result in minimal emissions. To correct this problem, the maintenance related collection and control system downtime limit was extended to 240 hours per year. In addition, exemptions from collection and control system requirements were added for work required by other enforcement agencies and for well raising activities. The cost of complying with of the gas collection system requirements was reduced by adding and modifying several definitions, creating an exemption for old landfills that pose no environmental or health risks, and adding a 7 day repair schedule for operator discovered leaks.

The current rule requires landfills with greater than 1 million tons of decomposable solid waste in-place to collect landfill gas and to control the emissions of methane and non-methane organic compounds in this collected landfill gas. Specifically, the rule limits leaks of landfill gas from the surface of the landfill or landfill gas collection or control system components to no more than 1000 ppmv, measured as methane. The rule also requires operators of landfill gas control equipment to meet a minimum total hydrocarbon (methane plus NMOC) destruction efficiency. The required destruction efficiency varies between 90% and 98%, depending on the type of equipment and the installation date.

On March 12, 1996, the federal Environmental Protection Agency (EPA) adopted 40 CRF Part 60 New Source Performance Standards (NSPS), Subpart Cc – Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills and Subpart WWW – Standards of Performance for Municipal Solid Waste Landfills. The District adopted these subparts by reference on October

8, 1997. Subpart WWW applies to new or modified landfills, which commenced construction on or after May 30, 1991. Subpart Cc applies to existing landfills that have accepted waste at any time since November 8, 1997 or that have additional capacity available for future waste deposition. Both subparts apply only to landfills with greater design capacities of greater than 2.5 million m^3 (3,269,000 yd^3) and greater than 2.5 million Mg (2,755,000 tons). Such landfills, that have a non-methane organic compound generation rate of greater than 50 Mg per year (55 tons per year), are required to collect and control landfill gas emissions.

Subpart WWW describes the numerous compliance criteria, emission calculation procedures, testing, monitoring, record keeping and reporting requirements that subject landfills must meet. The main compliance criteria include: a landfill surface leak limit of 500 ppmv as methane with a quarterly monitoring requirement; wellhead pressure, concentration and temperature limits with a monthly monitoring requirement; and emission control system performance specifications (98% destruction of NMOC or 20 ppmv NMOC, expressed as hexane, at outlet). Four Bay Area landfills are currently subject to these federal requirements for new or modified landfills. One other landfill is expected to become subject to these requirements within the next year.

Subpart Cc requires each state to develop a plan to control landfill gas emissions at existing landfills in a manner consistent with the performance standards specified in Subpart WWW. The plan is also required to include the monitoring, testing, reporting, record keeping requirements, and emission calculation procedures specified in Subpart WWW and the compliance times specified in Subpart Cc. Rather than adopting a single statewide requirement, the California Air Resources Board is requiring each District within the state to develop and implement a plan to comply with these federal Emission Guidelines (EG) requirements. The majority of landfills located in the Bay Area will be subject to Subpart Cc.

Other Agency Requirements

In addition to the District, the San Francisco Bay Regional Water Quality Control Board (RWQCB) and California Integrated Waste Management Board (CIWMB) also regulate solid waste disposal sites. The RWQCB, pursuant to California Code of Regulations Title 23, regulates solid waste operations in order to protect the quality of water resources in the state. The RWQCB regulations include, but are not limited to, landfill siting criteria and construction standards, leachate controls, and surface and groundwater monitoring requirements.

The CIWMB, pursuant to California Code of Regulations Title 14, exercises broad regulatory authority over solid waste landfill operations. The CIWMB regulations include but are not limited to intermediate cover requirements, landfill gas monitoring and control, vector control, and landfill closure and post-closure standards. In many instances, the CIWMB has delegated its authority to local enforcement agencies (LEAs) to administer provisions of the permitting, inspection and enforcement programs.

The requirements of both the RWQCB and CIWMB are essentially the same with respect to landfill gas and leachate controls. These agencies gas control requirements overlap or are similar to BAAQMD requirements, in that they both require gas mitigation. However, they do not regulate the specific nature of the

emissions released to atmosphere, such as toxicity, or include abatement efficiency standards like District rules require.

Purpose of Proposed Amendments

The proposed amendments to Regulation 8, Rule 34 are intended to achieve two objectives. The first objective is to meet the District's obligation to incorporate the federal Emission Guideline requirements into our existing rules. The second objective is ensure that landfill operators are aware of and comply with District requirements concerning the handling and aeration of VOC contaminated materials, including any new requirements that are proposed under Regulation 8, Rule 40.

As stated earlier, the federal Emission Guidelines for Municipal Solid Waste Landfills (40 CFR 60 Subpart Cc) require states to adopt a plan to meet the federal standards for control, monitoring, testing, record keeping, and reporting at subject landfills. Rather than adopting a single statewide requirement, the California Air Resources Board is requiring each District within the state to develop and implement a plan to comply with these federal Emission Guidelines (EG) requirements. District staff have determined that the majority of landfills located in the Bay Area will be subject the federal EG requirements. Staff have also determined that there are many inconsistencies between the federal EG requirements and the District's current Regulation 8, Rule 34. Note that all landfills that are subject to the NSPS or EG requirements are also subject to Title V operating permit requirements. District staff determined that the most cost effective use of District staff resources would be toward a rule development effort to incorporate the federal EG requirements, rather than to attempt to resolve the conflicting requirements between the District's current rule and the EG in each and every Title V permit. As a result, on September 15, 1997, the District informed the California Air Resources Board that the District plans to meet the federal EG requirements by amending Regulation 8, Rule 34 to incorporate the specific requirements of Subpart Cc and applicable sections of Subpart WWW. These proposed amendments to Regulation 8, Rule 34 incorporate all of the required federal EG requirements. The proposed amendments are also intended to improve clarity of the rule, enhance the flexibility of the rule, and streamline compliance during construction activities.

The District considers the use of contaminated soil as daily cover to be an aeration operation subject to Regulation 8, Rule 40. Although Regulation 8, Rule 40 was originally intended to apply to aeration of soil at the excavation site, it is written broadly enough to cover aeration of soil at sites other than the excavated site. The landfills however generally have a poor compliance history with respect to 8-40-403 notification requirements. In addition, most landfills did not obtain the required modifications of their permits to operate before they began using alternative cover materials. Using contaminated soils as daily cover material is a unique aeration operation, because the aerating soil is covered over the next day with garbage. However, the landfills could begin aerating a new lot of soil each day. Therefore, the aeration operation occurs year round, even though a single lot of soil may only be aerated for one day. Due to the unique nature of a daily cover operation, many landfills did not consider their use of contaminated soil as daily cover to be an aeration operation. Other landfills have contended that their aeration operation meets the 2-1-128.16 exemption, because no single lot of soil will be aerated for more than three months. Although these two suppositions are incorrect, District staff

believe that modifications to the current applicable regulations are necessary to clear up any ambiguities.

PROPOSED RULE AMENDMENTS

The proposed changes to Regulation 8, Rule 34 are discussed in detail below. An Exemption Flow Chart and a table entitled Summary of Applicable Requirements During Standard Operation are attached. Landfill operators and District staff may use these documents as a quick reference for determining which exemptions might apply and which requirements are applicable if a site meets one of the exemptions.

General

8-34-101 Description

Throughout this rule, District staff is proposing to change the term “organic compounds” to the term “non-methane organic compounds”. Although the definitions of these two terms are exactly the same, Regulation 8, Rule 34 needs to use language that is consistent with federal language, because many sections refer to specific 40 CFR requirements for further information about emission calculation procedures, monitoring, testing, and reporting requirements. The federal requirements for municipal solid waste landfills use the term non-methane organic compounds (NMOC). The first use of this term occurs in the description for the rule.

Staff is also proposing to add language to the description section to alert landfill operators that the use of contaminated soil or other VOC laden materials in cover operations is an aeration operation and is subject to Regulation 8, Rule 40.

8-34-111 Limited Exemption, Small Solid Waste Disposal Sites

This section currently exempts sites that are expected to have insufficient gas production rates to operate a control device from the requirements of this rule. This includes sites with low amounts of decomposable waste in place as well as old landfills. Staff proposes to change this section to an exemption for small sites only and to include the federal design capacity cut-off. Sites with design capacities of greater than 2.5 million m^3 and 2.5 million Mg are subject to more requirements than small sites; and must therefore be handled differently. The District’s exemptions for old landfills and low gas production rates will be handled in Sections 8-34-119 and 8-34-404.

8-34-113 Limited Exemption, Inspection and Maintenance

The exemption from control requirements during inspection and maintenance of the gas collection and emission control system will be extended to the proposed wellhead requirements. In addition, staff proposed to add the federal requirement that the duration of a gas collection system shutdown may not exceed 5 consecutive days.

8-34-114 Limited Exemption, Energy Recovery Device and Emission Control System

This exemption allows emission control systems that were installed before 1-1-95 to meet a lower total hydrocarbon control efficiency requirement. The federal requirements do not allow lower control efficiencies for older equipment. Therefore, this section is proposed to be deleted. A few older devices at landfills with design capacities below the federal cut-off will not be subject to the federal requirements. However, the District control efficiency requirements will be modified to allow either a minimum NMOC destruction efficiency or a maximum NMOC outlet concentration. The older devices are mainly flares, which are all expected to meet the new emission control system performance standards.

8-34-115 Exemption, Other Enforcement Agency Requirements

This section exempts landfills from collection system and emission control system requirements during certain construction operations. However, this section does not address routine construction activities, such as gas collection system expansion, that are required to maintain compliance with this rule. Therefore, variances are still being requested for many of these routine (and required) construction activities. Staff proposes to delete this section and replace it with Sections 8-34-117 and 8-34-118. Note that the new exemptions are consistent with federal EG requirements.

8-34-116 Limited Exemption, Well Raising

This section exempts landfills from certain collection system requirements during a particular type of gas collection system expansion called well raising. Staff is proposing to extend this exemption to the proposed wellhead requirements.

8-34-117 Limited Exemption, Gas Collection System Components

Staff is proposing to exempt individual gas collection system components from the continuous operation requirement, gas collection system leak limit, and wellhead requirements during certain required construction activities, such as component repairs and approved collection system expansion. It establishes limits on the number of wells that can be shut down at a time and on the amount of time that any one well can be shut down.

8-34-118 Limited Exemption, Construction Activities

Staff is proposing to exempt the landfill working face and limited surface areas of the landfill that are affected by approved construction activities from the landfill surface leak limit. This section lists the type of construction activities that may be considered for exemption and requires prior review and approval by the APCO of a construction plan. This section also describes the specific actions operators must take during construction, in order to minimize possible emissions.

8-34-119 Limited Exemption, Old Inactive or Closed Landfills

Staff proposes to move the exemption from collection system and control requirements for sites where waste was last placed more than 30 years ago from Section 8-34-111 to this section. The federal requirements were included for sites that have a gas collection system now and want to shut it down in the future.

8-34-120 Limited Exemption, Small Design Capacity Landfills

There are a few landfills in the Bay Area that are required to have a gas collection and emission control system per District requirements but are not required to meet Federal requirements. District staff is proposing to exempt these landfills from the following federally mandated requirements: wellhead limits, wellhead monitoring, wellhead repair schedules, surface monitoring, NMOC emission rate reports, compliance demonstration test, and performance test report. The cost of compliance with these federally mandated requirements is not warranted for these landfills, because their emissions are already controlled and emissions are not expected to increase significantly in the future.

8-34-121 Limited Exemption, Low Emission Landfills

Staff is proposing to exempt landfills, which have less than 1 million tons in place of decomposable solid waste and generate less than 50 Mg/year (55 tons/year) of NMOC, from gas collection and emission control system requirements. This exemption will normally apply to new active landfills, which have not yet accepted enough waste to trigger control requirements. This exemption could also apply to landfills that have a design capacity over the federal cut-off levels but that have large percentages of non-decomposable waste. These sites must still comply with any applicable reporting requirements such as Design Capacity and NMOC Emission Rate Reports.

Definitions

8-34-201 Solid Waste Disposal Site

Staff is proposing to add the federal definition of municipal solid waste landfill.

8-34-202 Solid Waste

Staff is proposing to add the federal definition of solid waste. This federal definition includes small quantities of specific types of hazardous wastes. Therefore, the District's statement that "Solid Waste does not include hazardous waste" was deleted to make the definitions consistent.

8-34-206 Background

Staff is proposing to replace the term "organic compounds" with "non-methane organic compound" in this definition, in order to be consistent with federal terminology.

8-34-209 Destruction Efficiency

Staff is proposing to replace the term "organic compounds" with "non-methane organic compound" in this definition, in order to be consistent with federal terminology.

8-34-213 Leak

Staff is proposing to replace the term "organic compounds" with "non-methane organic compound" in this definition, in order to be consistent with federal terminology.

8-34-215 Non-repeatable, Momentary Readings

Staff is proposing to replace the term “organic compounds” with “non-methane organic compound” in this definition, in order to be consistent with federal terminology.

8-34-217 Non-Methane Organic Compounds (NMOC)

Staff is proposing to replace the term “organic compounds” with “non-methane organic compound” in this definition, in order to be consistent with federal terminology.

8-34-220 Leak Repair

Staff is proposing to move the leak repair standard from Section 8-34-301.1 to 8-34-301.2. The applicable standard section is referred to in this definition and needs to be corrected.

8-34-225 Landfill Surface

Staff is proposing to add a definition for landfill surface to clarify that the landfill surface means the area under which decomposable solid waste is buried (excluding the working face), but it does not include property areas owned by the landfill that do not have any buried refuse.

8-34-226 Controlled Solid Waste Disposal Site

Staff is proposing to add this definition. This term is used in several reporting requirements.

8-34-227 Surface Leak

Currently the definition of a surface leak and the location of the leak measurement are all contained within the surface leak standard. For clarity and convenience, staff is proposing to move this information to a surface leak definition. The term surface leak is used in several other requirements as well. The location of the surface leak measurement is proposed to be consistent with federal measurement requirements.

Standards

8-34-301 Landfill Gas Collection and Emission Control System Requirements

Staff is proposing to change the exemptions referenced in this standard to be consistent with the new proposed exemptions and to rearrange several subsections for clarity. In addition, staff is proposing to incorporate the federal emission guidelines into this section. Staff is proposing to apply these requirements to all operators with gas collection and emission control systems, so that there are only one set of standards that must be met.

Section 8-34-301.3 previously required flares to be enclosed ground flares and to meet a 98% methane and organic compound destruction efficiency. Staff is proposing to move the destruction efficiency requirement to subsection 301.4. Subsection 301.3 now contains only a requirement for flares to be enclosed ground flares (no open flares).

Subsection 301.4 previously contained a 97% methane and organic compound destruction efficiency requirement for energy recovery equipment. Staff is proposing a single destruction efficiency requirement for all emission control equipment (energy recovery devices and flares). The proposed destruction efficiency is 98% of NMOC and is consistent with federal control standards.

Staff is proposing to include an alternative standard to the emission control system destruction efficiency requirement. Control systems must comply with either subsection 301.4 or 301.5. The proposal for subsection 301.5 is to limit the NMOC concentration at the outlet of an emission control system to 30 ppmv, dry basis, expressed as methane, and corrected to 3% oxygen. The federal requirements allow an NMOC concentration of 20 ppmv, dry basis, expressed as hexane, and corrected to 3% oxygen. This federal requirement is equivalent to 120 ppmv, expressed as methane. Staff reviewed source test data from numerous flares and IC engines burning landfill gas. Staff compared compliance status for the devices based on current District destruction efficiency limits, the two alternative federal limits, and the two proposed District limits. For flares, the source tests indicated 100% compliance with the current District limit and with either one or the other of the District's two proposed compliance alternatives. For IC engines, 53% of the engines tested failed to meet the current destruction efficiency requirement of 97% of total hydrocarbon and 14% of the engines tested failed to meet the federal control standards. For engines with an outlet NMOC concentration of less than 30 ppmv, expressed as methane, 47% of the engines failed to meet the current District destruction efficiency requirement (about the same as the overall non-compliance rate). For engines with an outlet NMOC concentration between 30 and 120 ppmv, expressed as methane, 70% of the engines failed to meet the current District destruction efficiency requirements. Increasing the outlet NMOC concentration limit above 30 ppmv results in a higher non-compliance rate with the current limit. Staff concluded that the federal NMOC concentration limit of 20 ppmv, expressed as hexane, was - in most cases – less stringent than the District's current destruction efficiency requirements. However, staff recognizes the difficulty that operators have with meeting a 98% NMOC destruction efficiency requirement when inlet NMOC concentration is low. Therefore, staff is proposing to add an NMOC emission concentration limit as an alternative to the destruction efficiency requirement. However, staff is proposing a lower NMOC concentration limit than the federal requirement to ensure that Regulation 8, Rule 34 is as stringent in controlling emissions as it is currently.

8-34-303 Landfill Surface Requirements

Staff is proposing to change the exemptions referenced in this standard to be consistent with the new proposed exemptions. Staff is proposing to reduce the surface leak limit from 1000 ppmv expressed as methane to 500 ppmv expressed as methane, to be consistent with the federal performance standard for municipal solid waste landfills. This section also references a proposed surface leak repair schedule. Staff is proposing to apply this requirement to all landfills with gas collection equipment, so that there is only one standard that must be met.

References to permit requirements for using contaminated soil as cover material were deleted. Control requirements for contaminated soil operations will be imposed in a new section of this rule. These requirements are planned to be the same as the new requirements that will be proposed for Regulation 8, Rule 40

under a separate rule revision. Permit requirements will be clarified in Regulation 2, Rule 1 under a separate rule revision.

8-34-304 Gas Collection System Installation Requirements

Staff is proposing to incorporate the federal EG requirements for the timing of installing additional gas collection wells. In addition, staff is proposing to codify the District's current policy of requiring new wells in an area when 1 million tons of decomposable refuse have been placed in that area.

8-34-305 Wellhead Requirements

Staff is proposing to incorporate the federal EG standards for wellheads. An active gas collection system must be used to meet these requirements. This section will only apply to gas collection systems that are required per the federal EG or NSPS.

Administrative Requirements

8-34-402 Small Solid Waste Disposal Site Exemption Petition

Staff is proposing to modify the title of this section so that it is consistent with the title of Section 8-34-111.

8-34-405 Design Capacity Reports

Staff is proposing to incorporate the federal requirement to submit Initial and Amended Design Capacity Reports. The applicable federal requirement is referenced in this section, because it contains a detailed discussion of the content and format of the report.

8-34-406 Initial NMOC Emission Rate Report

Staff is proposing to incorporate the federal requirement to submit an Initial NMOC Emission Rate Report. The applicable federal requirement is referenced in this section, because it contains a detailed discussion of the emission calculation procedures to be used and the content and format required for the report.

8-34-407 Periodic NMOC Emission Rate Reports

Staff is proposing to incorporate the federal requirement to submit Periodic NMOC Emission Rate Reports. The applicable federal requirement is referenced in this section, because it contains a detailed discussion of the emission calculation procedures to be used and the content and format required for the reports.

8-34-408 Collection and Control System Design Plans

Staff is proposing to incorporate the federal requirement to submit a Collection and Control System Design Plan. The applicable federal requirement is referenced in this section, because it contains a detailed discussion of the objectives that the collection and control system should achieve and the information that must be included in the design plan. Staff is proposing to

extend the Collection and Control System Design Plan requirement to any Bay Area landfill that has or is required in the future to have a gas collection system. The design plans will be used as a permitting tool to pre-approve the required gas collection system expansions. Staff is also proposing to link qualifying for exemptions during certain construction to having an approved design plan. For instance, suppose an active landfill has an approved collection and control system design plan that describes installing 10 additional wells in specific locations. The additional wells are required in order to maintain compliance with Section 8-34-304. As long as the landfill is installing these wells as described in their plan, the affected construction area will be exempt from the landfill surface leak limit (until construction is completed) and the gas collection system may be shut down for a short period of time to connect the new wells. This new procedure should streamline the process of expanding the gas collection system and improve compliance with the 8-34-304 standard.

8-34-409 Closure Report

Staff is proposing to incorporate the federal requirement to submit a Closure Report when an existing controlled landfill permanently ceases to accept waste. The applicable federal requirement is referenced in this section, because it contains a detailed discussion of the content and format of the report.

8-34-410 Equipment Removal Report

Staff is proposing to incorporate the federal requirement to submit an Equipment Removal Report when a landfill is claiming that all or portions of their landfill have such low gas production that control is no longer feasible. The applicable federal requirement is referenced in this section, because it contains a detailed discussion of the content and format of the report.

8-34-411 Annual Report

Staff is proposing to incorporate the federal requirement to submit an Annual Report and is proposing to extend this requirement to all controlled landfills. For controlled landfills with a design capacity below the federal cut-off, the Annual Report will only contain information related to equipment shutdowns and operator discovered leaks. This information is currently required to be collected, but it is not currently required to be reported on an annual basis.

8-34-412 Compliance Demonstration Test

Staff is proposing to incorporate the federal requirement to conduct an initial Compliance Demonstration Test at the emission control system for controlled landfills with design capacity greater than 2.5 MM m^3 and 2.5 MM Mg. Staff is also proposing an annual Compliance Demonstration Test for any emission control system that is also subject to Title V permitting requirements.

8-34-413 Performance Test Report

Staff is proposing to incorporate the federal requirements for the Performance Test Report for any landfill that is required to conduct a Compliance Demonstration Test. The Performance Test Report will become part of the Annual Report.

8-34-414 Repair Schedule for Wellhead Excesses

Staff is proposing to incorporate the federal requirements to make repairs to the gas collection system if any excesses are detected at the wellheads. The repair timing and re-monitoring requirements are the same as the federal requirements. If excesses cannot be fixed, this section requires expansion of the gas collection system.

8-34-415 Repair Schedule for Landfill Surface Leak Excesses

Staff is proposing to incorporate the federal requirements to make repairs to the gas collection system and soil cap if any landfill surface leak excesses are detected. The repair timing and re-monitoring requirements are the same as the federal requirements. If surface leak excesses cannot be fixed with cap repairs or gas collection system adjustments, this section requires expansion of the gas collection system.

8-34-416 Cover Repairs

Staff is proposing to incorporate the federal requirement for controlled landfills to repair the soil cover as necessary to prevent leaks from occurring.

Monitoring and Records

8-34-501 Operating Records

Staff is proposing to incorporate the federal record keeping requirements into this section and to extend these record keeping requirements to all landfills or operators subject to this rule. Proposed modifications include: keeping records of all collection or control system downtime and the reason for the downtime; continuous temperature records for enclosed combustors as well as for flares; records of leak excesses and the action taken to repair the leaks; annual waste acceptance records and records concerning non-degradable waste; continuous gas flow records; and records of key operating parameters for non-enclosed combustors. Staff is also proposing to extend the record retention requirement to five years, because most Bay Area landfills will be subject to Title V.

8-34-502 Emission Records, Inactive Landfills Without a Gas Collection System

Staff is proposing to delete this section because the exemption referenced is no longer applicable.

8-34-504 Portable Hydrocarbon Detector

Staff is proposing to replace the term “organic compounds” with “non-methane organic compound”, in order to be consistent with federal terminology.

8-34-505 Wellhead Monitoring

Staff is proposing to incorporate the federal requirement for monthly monitoring at wellheads for any gas collection system that is subject to Section 8-34-305.

8-34-506 Landfill Surface Monitoring

Staff is proposing to incorporate the federal requirement for quarterly surface monitoring for any controlled landfill subject to the federal requirements.

8-34-507 Continuous Temperature Monitor and Recorder

Staff is proposing to incorporate the federal requirements for a continuous temperature monitor and recorder at flares and other enclosed combustors. This requirement will apply to all enclosed combustors.

8-34-508 Gas Flow Meter

Staff is proposing to incorporate the federal requirements for a gas flow meter for all controlled landfills.

8-34-509 Key Emission Control System Operating Parameter(s)

Staff is proposing to incorporate the federal requirements to establish a key emission control system operating parameter for any non-enclosed combustor and to monitor this parameter at least monthly.

8-34-510 Cover Integrity Monitoring

Staff is proposing to incorporate the federal requirement to monitor the landfill surface cover at any controlled landfill, on at least a monthly basis.

Manual of Procedures

8-34-601 Determination of Emissions

Staff is proposing to incorporate two new EPA reference methods and to use the term “non-methane organic compound” instead of “organic compounds” or “VOC”.

8-34-602 Collection and Control System Leak Inspection Procedures

Staff is proposing to add language to this section to clarify that it applies only to gas collection and emission control system leak inspections.

8-34-603 Landfill Gas Sampling Procedure

Staff is proposing to add BAAQMD sampling procedures and two new EPA reference methods to this section.

8-34-604 Determination of Concentration

Staff is proposing to add applicable sections of this rule to this section and to expand the types of compounds that might be tested for.

8-34-605 Determination of NMOC Emission Rate

Staff is proposing to reference the applicable federal emission calculation procedures for several different sections of this rule.

8-34-606 Determination of Maximum Expected Gas Generation Rate

Staff is proposing to reference the applicable federal procedures for determining the maximum expected gas generation rate. This is a required element of the Collection and Control System Design Plan.

8-34-607 Landfill Surface Inspection Procedures

Staff is proposing to use a combination of EPA Reference Methods, BAAQMD procedures, and federal EG requirements to describe the landfill surface inspection procedures.

EMISSIONS AND EMISSION REDUCTIONS

The majority of the proposed rule changes relate to the District's requirement to incorporate federal EG requirements for municipal solid waste landfills. These rule changes not expected to have any measurable affect on emissions. All of the Bay Area landfills that are required to meet the federal EG requirements are already required to have gas collection and emission control systems per current District requirements. The major standards changes involve reducing the surface leak limit to 500 ppmv and changing the emission control system performance requirements to either 98% NMOC destruction or 30 ppmv NMOC (expressed as methane) outlet concentration.

Since landfill gas collection systems should be designed to allow no surface leaks, reducing the leak limit should not result in any emission changes. Meeting the new surface leak limit will require landfill operators to be more diligent when designing, installing, maintaining, and expanding their gas collection systems. Some operators have predicted slight increases in gas flow due to improvements in their gas collection systems. Current emission control systems should be able to handle any such increases in gas flow with little or no modification. If these slight increases in gas flow do occur, there will be slight increases in secondary pollutants from the emission control systems. These secondary pollutant emission increases are not expected to exceed any maximum permitted emission rates for the devices.

The emission control system performance requirement of 98% NMOC destruction is a little more stringent than the current total hydrocarbon destruction efficiency requirements. However, staff is proposing an alternative compliance option to the destruction efficiency requirement. The maximum NMOC outlet concentration of 30 ppmv, dry basis, expressed as methane, corrected to 3% oxygen was chosen specifically to ensure that the proposed control system performance requirements would be no less stringent than the current rule. Therefore, the proposed control system performance requirement changes are not expected to have any affect on emissions.

The exemptions from collection and control system requirements and the surface leak limit during construction activities apply only to the small area of the landfill and collection system immediately affected by the construction. The temporary suspension of these requirements are expected to result in little or no increase in emissions. The construction activities described are necessary and have been approved under variances in the past.

ECONOMIC IMPACTS

Socioeconomic Impacts

This report has not been completed yet.

Incremental Costs

The costs associated with compliance with the proposed District rule amendments are minimal. Landfills that are subject to the EG will be required to comply with the federal requirements, regardless of whether or not the District adopts these changes. For EG landfills, the District is not proposing any monitoring, testing, record keeping, or reporting requirements that are above and beyond what is required by the federal EG. The only difference in the proposed standards and the federal EG standards are:

(a) The District's existing requirement to use enclosed flares only,
(b) The District's existing requirement to monitor the gas collection and emission control system components on a quarterly basis, and
(c) The District's proposal to have a maximum NMOC concentration at the outlet of the control device of 30 ppmv as methane (5 ppmv as hexane) instead of the federal EG maximum NMOC concentration of 20 ppmv as hexane.

All Bay Area landfills that will be subject to the EG are currently subject to District collection and control requirements. Therefore, there are no additional costs associated with (a) or (b). All of the flares and nearly all of the existing IC engines are expected to comply with the District's proposed maximum NMOC outlet concentration or the 98% NMOC destruction efficiency requirement. For the nine District IC engine source tests that indicated non-compliance with the proposed standard, most of the engines were poorly performing engines that were not meeting existing standards. There may be a small additional cost for the few engine operators who were complying with the current requirement but not the proposed standards. Compliance can be achieved through better tuning and increased vigilance. The additional costs for these activities are minimal.

On the other hand, the allowance of a surface leak repair schedule and the streamlining of the gas collection system expansion tasks are expected to result in fewer variances and fewer compliance problems. Therefore, the proposals concerning repair schedules and construction activity exemptions are expected to result in some cost savings due to reduced penalties and variance fees.

For landfills that currently have gas collection systems but that are not subject to the EG, the District is requiring some additional monitoring (gas flow meter, key system operating parameter, cover integrity), record keeping (all collection and control system down time, gas flow records, waste acceptance records), and reporting (Collection and Control System Design Plan, Annual Report) requirements. Some of these requirements are already stated in permit conditions. The main compliance cost will be for installing a gas flow meter, preparing the Collection and Control System Design Plan, and submitting Annual Reports. Much of the compliance cost is expected to be offset by reduced penalties and variance fees.

ENVIRONMENTAL IMPACTS

All of the Bay Area landfills that will be subject to the federal emission guidelines requirements already have gas collection systems and emission control systems in place. The proposed amendments to performance standards may require minor improvements to these systems, but are not expected to require complete replacement of these systems. Some facilities are now considering installing energy recovery equipment to replace their existing flares. However, the driving force behind these proposals is the economic advantage associated with currently available tax incentives and not compliance with the federal emission guidelines requirements.

Minor improvements to a gas collection system may require some construction activities. For instance, additional gas collection wells may be required to ensure that all of the gas in an area is collected. Or, a landfill operator may need to expand their gas collection system sooner than previously planned as a result of the collection system installation requirements specified in Section 8-34-304. The limitations on gas collection system component shut downs and construction activities described in exemption Sections 8-34-117 and 118 will minimize organic emissions during these construction activities. Particulate emissions associated with these increases in construction activities are expected to be negligible.

The remainder of the rule changes involve enhanced monitoring requirements and increased record keeping and reporting requirements. The enhanced monitoring requirements should result in better compliance with this rule. There are no environmental impacts associated with the record keeping or reporting requirements.

The proposed rule amendments are not expected to result in any significant environmental impacts.

REGULATORY IMPACTS

The applicable District rules, CARB guidelines, and federal regulations that apply to municipal solid waste landfills are described in detail in the Background Section of this report. The differences between the District's proposed requirements and the federal EG requirements are described in Economic Impacts section of this report.

RULE DEVELOPMENT HISTORY

An internal District Landfill Work Group was created in October 1997 and first met in December 1997. The group included participants from permits, enforcement, and source test. The group met approximately once per month through April 1998.

The group reviewed the federal EG requirements and collectively determined the best approach to incorporate these requirements into Regulation 8, Rule 34. The group also discussed current problems with the rule and made recommendations on how to address these requirements. One of the problem areas discussed was the number of variances that the landfills are still requesting. Staff also discussed the use of contaminated soil as cover material at landfills. A compliance and enforcement guideline concerning contaminated soil use at landfills was issued as a result of these discussions.

The first workshop is scheduled for March 19, 1999.

DISTRICT STAFF IMPACTS

The regulatory changes to adopt federal emission guidelines will result in increased staff time to review and approve design plans and to manage the other reporting requirements. Additional staff time will also be required to review construction plans for projects not related to gas collection system expansion. However, some reductions are expected in the staff time required to respond to violation notices and variance requests. Most of the Bay Area landfills will now be subject to Title V permitting requirements. Overall, staff expects a moderate increase in staff time required to manage landfills in the near term (< five years). Once all initial design plans are approved and Title V permits are completed, staff expects only a small increase in staff time required to manage landfills.

COMMENTS AND RESPONSES

The District has not received any formal comments from the landfill industry on these proposals.

One independent consultant, Bernard Bingham, has submitted several correspondence advocating that the District require controls on aeration of contaminated soil and to ban the use of contaminated soil as cover material at the landfills.

CONCLUSION

The proposed regulatory changes are necessary for compliance with EPA and CARB directives to implement a plan to comply with the federal Emission Guidelines for Municipal Solid Waste Landfills. These changes can be readily enacted, since all subject facilities already have gas collection and emission control systems in place. These proposed changes would not result in any significant compliance costs or adverse environmental impacts. These proposed changes would require some additional staff after implementation.

Pursuant to the California Health and Safety Code, Section 40727, regulatory amendments must meet findings of necessity, authority, clarity, consistency, non-duplication, and reference. The proposed amendments are:

Necessary to meet EPA and CARB requirements,

Authorized by California Health and Safety Code, Section 40702,

Clear, in that the amendments specifically delineate affected industry, compliance options and administrative requirements for industry subject to this rule,

Consistent with other District rules, and not in conflict with state or federal law,

Non-duplicative of other statutes, rules or regulations, and

The amendments properly reference the applicable EPA and District rules and test methods.

REFERENCES

(1) Compilation of Air Pollutant Emission Factors, AP-42, fifth edition, Chapter 2.4 Municipal Solid Waste Landfills, last revised 11/98.